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Jay S. Hammond, Governor

Annual Performance Report for

STATUS OF IMPORTANT NATIVE CHINOOK SALMON STOCKS IN SOUTHEASTERN ALASKA

by

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Period Covered: July 1, 1979 to June 30, 1980.

ABSTRACT

The chinook salmon, Oncorhynchus tshawytscha (Walbaum), research project was inititated in 1971 to determine the status of important chinook salmon stocks and methods of enhancing depleted populations in southeastern Alaska. Major emphasis during the last several years has been to determine migration routes and areas of harvest of Southeastern chinook through coded wire tagging of juveniles, and monitoring of chinook salmon escapements.

The Taku Inlet drift gill net fishery was monitored to determine the incidental catch of chinook salmon. An estimated 794 mature and 3,031 immature chinook salmon were harvested during 1979.

The enumerated escapement of 4,156 five and six-year old spring chinook salmon into the Taku River, was above the eight-year average. Sampling at the Nakina weir indicated all year classes were strong except the return of six-year-olds from the 1973 brood year. From age class data collected it appears that the 1980 return should be the largest observed during the past eight years. All age classes should be strong.

Based on observations and interviews it appears that hooking and releasing of prespawning chinook salmon in the Nakina River is not a significant mortality factor.

During 1979 a total of 22,911 chinook salmon smolts and rearing juveniles were captured in various tributaries of the Taku River and coded wire tagged and 24,164 were captured and tagged in the Stikine River.

Seining of chinook smolts in the Taku River was much less efficient than capture by baited minnow traps. However, it appears that seining in the esturary will be more efficient than minnow trapping in the river.

Escapement information on chinook salmon in the Stikine, Unuk, Chickamin, Situk, Keta, Blossom and King Salmon Rivers is presented.

Recommendations for management include the following: Continue restrictive regulations designed to protect maturing native chinook and continue to monitor drift gill net and sunken gill net fisheries to determine the catch of incidentally caught immature chinook salmon.

Research recommendations include continued coded wire tagging and recovery of native spring chinook salmon, and monitoring of escapements and determining the sport harvest of precocious male chinook salmon.

RECOMMENDATIONS

Management

1. Restrictive regulations designed to protect maturing chinook salmon stocks near their rivers of origin should be continued. Southeast chinook salmon stocks are still at a low level and continued restrictions are necessary to rebuild the stocks.

2. Drift gill net fisheries throughout Southeastern should be monitored to determine if large numbers of immature chinook salmon are being harvested incidentally to the target species. Night closures should be made in areas with high incidental catches of chinook salmon.

3. The incidental catch of chinook salmon in sunken gill nets which are targeting on grey cod, Gadus macrocephalus Tilesius, should be monitored.

Research

1. Coded wire tagging of chinook salmon smolts and juveniles should continue on the Taku, Stikine and Unuk Rivers. Emphasis should center on capturing juveniles in the upriver areas in the fall by minnow traps and possibly weirs, and in the esturary in the spring by beach seine.

2. Continue sport and commercial sampling of chinook salmon to recover coded wire tags. Recovery of tags will permit determination of marine migration patterns and areas of harvest at various life history stages of important native chinook salmon stocks.

3. Continue to determine the current status of major and medium native chinook salmon systems in Southeastern through monitoring of escapements by aerial, ground or weir enumeration.

4. Sport caught chinook salmon less than 28" total length (T.L.) should be sampled from May 1 thru June 15 throughout Southeastern to determine maturity. This would permit determination of the percentage of precocious males harvested by area.

OBJECTIVES

1. Determine the catch and escapement of Taku River chinook salmon.

2. Determine the catch and escapement of Stikine River chinook salmon.

3. Determine the catch and escapement of Unuk River chinook salmon.

4. Determine the escapement of chinook salmon in other important spawning rivers of southeast Alaska.

TECHNIQUES USED

Commercial chinook salmon harvest data were taken from statistical runs which were compiled from individual fish tickets.

Mid-eye to fork of tail measurements were taken from chinook salmon sampled on the spawning grounds.

During August a tripod weir was operated on the Nakina River approximately 137 m (150 yd) above the junction with the Silver Salmon River. Chinook spawning above the weir were enumerated after they could no longer maintain station in the river and floated against the weir face. The structure was cleaned of carcasses at 10 a.m. and 7 p.m. daily. All species were enumerated, and length data, scale samples and sex determination were collected from the chinook salmon. Upriver surveys of both banks of the river were conducted every other day to enumerate and sample spawned-out chinook salmon which had not floated downriver to the weir. The survey area extended approximately 2.4 km (1.5 mi) above the weir.

All escapement surveys were conducted by foot or by "Alouette II", "Hughes 500" or "Hiller 12E" helicopters. Only three and four ocean chinook salmon (660 mm or 26" in total length or larger) were enumerated during aerial and foot surveys.

Gee minnow traps baited with salmon roe or various beach seines were used to capture rearing salmonids.

Several seines were used in the Taku River, the size depending on the area being fished. The small seine was 40 ft (11.99 m) long by 6 ft (1.8 m) deep and 3/8 in (9.375 mm) square mesh. This seine was used only in small, shallow areas and was operated by two or three personnel wearing hipboots. A larger seine was 100 ft (29.97 m) long by 6 ft (1.8 m) deep of 3/8 in (9.375 mm) square mesh. This seine was used in the main river and in large sloughs. Normally, one man held one end of the net on shore while the remainder of the net was set from a 14 ft (4.19 m) long aluminum river boat powered by a 50 horse power outboard jet. Sets were made in a hook or half-circle shape and with the current of the river.

A beach seine used in Taku Inlet was 250 ft (72 m) long by 12 ft (3.6 m) deep and constructed of three panels of web. The two end panels were each 100 ft (29.97 m) long, of 1/2 in (20 mm) square mesh, and the center panel was 50 ft (14.99 m) long, of 1/4 in (6.25 mm) square mesh. In setting this seine, two people held one end on shore while the remainder of the net was set from a 24 ft (7.2 m) inboard jet powered aluminum boat. Four people were required to purse the net onto the beach, hold it open and remove the catch.

Chinook salmon smolts and rearing juveniles were anesthetized with MS 222, marked by removal of the adipose fin, and micro-wire tagged with a Northwest Marine Technology, Inc. tag injector. The tagging unit was modified to function under remote conditions by conversion to a 24 volt battery system (Koerner, 1977).

The micro-wire tags were made of type 302 stainless steel wire and were 0.25 mm (0.0098 in) in diameter and 1.0 mm (0.0394 in) in length. A code, based on the binary system, was etched into the surface of the wire to identify the agency tagging and the specific treatment of the individual.

To obtain maximum retention of the micro-wire tags they must be implanted in the cartilaginous wedge in the fish's snout. Several fish were thus sampled daily to insure proper tag placement. The fish's skull was bisected by a vertical incision through the dorsal median plane to the oral cavity. The tag was then readily observed in the snout. If the tag was improperly placed, adjustments in the depth of the head mold were made and several more fish checked to ensure proper placement.

The micro-wire tags were magnetized by dropping the tagged fish head first through a ring magnet into a bucket of water. The fish were then passed through a NMT field sampling detector to check for the presence of a magnetized tag.

Samples of chinook salmon smolts and rearing juveniles were collected for age and growth determinations. Fish were measured from the tip of the snout to the fork of the tail to the nearest millimeter and several scales were taken from the preferred area at the posterior edge of the dorsal fin, two rows above the lateral line.

Scales were collected to determine the age of chinook salmon harvested in various sport and commercial fisheries in Southeast, as well as on the spawning grounds. Scales were again taken from the preferred area. Because of the high occurrence of regeneration in chinook salmon scales, five extra scales were taken from each side of each fish near the preferred area and placed in a numbered coin envelope.

Scales were later examined under a binocular microscope and the first complete scale was soaked in detergent, cleaned, and mounted on a numbered gum card. They were pressed in cellulose acetate and analyzed under an Eberback microprojector at the magnification of 80 X.

FINDINGS

Taku River Studies

Drift Gill net Fishery in Taku Inlet:

The spring drift gill net fishery was again closed in 1979 as during the past 3 years to protect maturing Taku River spring chinook salmon. The drift gill net fishery now opens on the third Monday in June and 137 mm to 140 mm (5 3/8 in to 5 1/2 in) stretched measure nylon mesh gill nets are utilized to harvest primarily sockeye salmon, Oncorhynchus nerka (Walbaum).

Concern for the high incidental harvest of immature chinook salmon during the 1973 sockeye salmon fishery led to the annual monitoring of the Taku Inlet drift gill net fishery (Kissner, 1973-1979). From discussions with gill net fishermen it was the concensus of opinion that the majority of the incidental take occurred during hours of darkness (Kissner, 1977).

Apportioning preliminary catch figures indicates that 794 (20.8%) maturing chinook salmon and 3031 (79.2%) immature chinook salmon were harvested during 1979. Many of the maturing chinook were age 1.2 precocious males. The catch of immature chinook salmon was the largest observed harvest since 1973; however, the sockeye salmon catch which is the target species, was one of the largest harvests since records have been kept. Because a large portion of the catch of immature chinook salmon occurred in Port Snettisham, this area was closed from mid-July through the first week of August.

Escapement:

The 1979 escapement of chinook salmon into various tributaries of the Taku River monitored annually was 4,156 three and four ocean adults (Table 1). The escapement was larger than last year's, but not as large as those observed during 1976 and 1977.

In the Nakina River, which is the major clear water chinook spawning tributary of the Taku River, 2,110 three and four ocean chinook were enumerated by Alouette II helicopter. Sampling of chinook salmon carcasses for age, length and sex at the Nakina carcass weir indicated that: the 1979 escapement of females was the second lowest since 1973, as only 38.4% of the three and four ocean adults were females. All age classes of returning chinook salmon were fairly strong, except the return from the 1973 brood. As predicted by Kissner (1979), this age class was very weak.

Based on age class data collected at the Nakina weir (Tables 2-4) it appears that the 1980 return should be the largest observed during the past 8 years. Returns by brood year during 1980 are projected to be as follows: Age 1.1 (1977 brood) should be strong, since the 1977 escapement of females into the Nakina River is the largest observed since 1959. Age 1.2 (1976 brood) should be strong because of the number of 1.1 chinook salmon observed during 1979. Age 1.3 (1975 brood) should be very strong as one and

Table 1. Peak aerial escapement counts of chinook salmon in the Taku River tributaries, 1951-1979.

Year	Nakina	Kowatua	Tatsamenie	Dudidontu	Tseta	Nahlin	Total
1951	5,000	...	...	400	100	1,000	6,500
1952	9,000	...	...	...	...	...	9,000
1953	7,500	...	...	...	...	...	7,500
1954	6,000	...	...	...	...	...	6,000
1955	3,000	...	...	...	...	...	3,000
1956	1,380	...	...	...	...	...	1,380
1957	1,500*	...	...	...	...	...	1,500
1958	2,500*	...	...	4,500	...	2,500	9,500
1959	4,000*	...	...	...	...	...	4,000
1960	Poor	...	...	...	...	...	Poor
1961	Poor	...	...	...	...	...	Poor
1962	...	...	...	25	81	216	322
1963	...	...	...	...	...	...	...
1964	...	...	...	...	...	...	...
1965	3,050	200 G	50 G	100	18	37	3,455
1966	...	14 G	150 G	267	150	300	881
1967	...	250 G	...	600	350	300	1,500
1968	...	1,100 E	800 E	640	230	450	3,220
1969	...	3,300 E	800 E	...	...	...	4,100
1970	...	1,200 E	530 E	10	25	26	1,791
1971	...	1,400 E	320 E	165	...	473	2,358
1972	1,000	130 G	170 G	103	80	280	1,763
1973	2,000	100 G	200 G	200	...	300	2,800
1974	1,800	235 G	120 G	20	4	900	3,079
1975	1,800	...	...	15	...	274	2,089
1976	3,000	341 G	620 E	40	...	725	4,726
1977	3,850	580 G	573 E	18	...	650	5,671
1978	1,620	490 G	550 E	...	21	624	3,305
1979	2,110	430 G	750 E	9	...	857	4,156

G = water glacial
E = water clear
* = Counts of total river not conducted--comparison made from carcass weir enumeration

Table 2. Length frequency by age of male chinook salmon sampled at the Nakina carcass weir, 1979.

(MEFT - mm)	1.1	1.2	1.3	1.4	1.5
250 - 274	1				
275 - 299	24				
300 - 324	134				
325 - 349	267				
350 - 374	180				
375 - 399	54	11			
400 - 424	7	41			
425 - 449	8	86			
450 - 474		188			
475 - 499		204			
500 - 524		288			
525 - 549		208			
550 - 574		153	15		
575 - 599		78	19		
600 - 624		71	10		
625 - 649		22	12		
650 - 674		2	34		
675 - 699		1	35		
700 - 724			40		
725 - 749			58		
750 - 774			47	6	
775 - 799			36	1	
800 - 824			27	7	
825 - 849			10	11	1
850 - 874			12	10	
875 - 899			2	5	1
900 - 924			1	6	
925 - 949			1	13	
950 - 974				7	
975 - 999				6	
1000 -1024				1	
1025 -1049				1	
TOTALS	675	1,353	359	74	2

Table 3. Length frequency by age of female chinook salmon sampled at the Nakina carcass weir, 1979.

(MEFT - mm)	Age 1.3	Age 1.4	Age 1.5
675 - 699	7		
700 - 724	12		
725 - 749	34		
750 - 774	34	5	
775 - 799	43	1	
800 - 824	40	11	
825 - 849	15	18	1
850 - 874	10	8	1
875 - 899	4	11	2
900 - 924	1	7	
925 - 949		5	
950 - 974		1	
975 - 999			
TOTALS	200	67	4

Table 4. Number and age of male and female chinook salmon sampled at the Nakina carcass weir, by year.

MALE

Age	1956	1957	1958	1959	1973	1974	1975	1976*	1977	1978	1979
1.1	754	699	1,335	838	336	730	228	64	1,145	2,277	675
1.2	1,201	1,249	2,404	1,132	853	718	505	412	434	915	1,353
1.3	312	242	561	611	273	267	90	236	283	56	359
1.4	86	110	123	298	242	124	63	95	368	88	74
1.5	0	0	0	0	7	3	1	4	7	8	2
n	2,353	2,300	4,423	2,879	1,711	1,842	887	811	2,237	3,344	2,463

FEMALE

Age	1956	1957	1958	1959	1973	1974	1975	1976*	1977	1978	1979
1.2	8	0	0	3	0	0	0	0	0	0	0
1.3	287	274	469	778	210	197	38	206	298	36	200
1.4	129	122	175	410	404	223	31	179	834	164	67
1.5	0	0	0	0	0	0	0	0	11	7	4
n	424	396	644	1,191	614	420	69	385	1,143	207	271

* Partial weir at Grizzly Bar.

two ocean jack returns from this brood were both large and age 1.4 (1974 brood) returns should be good based on returns of the brood year at 1.1, 1.2 and 1.3.

This does not mean that the population is again in a healthy condition. During 1951 - 1955, with gill net and troll harvests of 10,000 - 25,000 maturing chinook salmon in the vicinity of Taku Inlet, there were escapement levels of 3,000 to 9,000 chinook salmon (6,100 average) into the Nakina.

During the 5-year period 1975 - 1979, there were almost no known harvest of mature chinook salmon (only 423 in the gill net fishery in 1975) and the escapement to the Nakina varied between 1,620 to 3,850 (2,476 average).

Studies during the 1950's comparing the number of female chinook salmon spawning in the Nakina River vs. total return of maturing chinook salmon to the gill net and troll fishery and Nakina spawning ground indicate that the Nakina River should have at least 3,500 females annually. When escapements dropped below 2,000 females the return to the spawning grounds from these brood years was unsatisfactory and this led to the strict curtailment of commercial gill net fishing in 1962. During the last 7 years, the number of females spawning in the Nakina River has averaged only 1,194 per year.

Effect of Catch and Release on Chinook Salmon:

During early July prespawning chinook salmon were captured via sport gear in the Nakina River in an attempt to determine if hooking mortality was a significant mortality factor. In the past we had received reports of individual sport fishermen catching and releasing up to 60 chinook salmon per day. The potential for damaging the spawning run appeared quite possible, as in some years significant amounts of fishing effort for chinook occur on the Nakina River.

Fish were to be captured by typical sport gear in the holding holes above the carcass weir, fin clipped, released and recovered at the carcass weir. Since almost all chinook salmon above the carcass weir are enumerated after they die, comparisons of spawning success of the females were to be made between the finclipped and non-finclipped females.

Extremely high water was encountered during early July and only five chinook salmon were captured and finclipped. The sample size was much too small for a meaningful study, however, capturing and holding of chinook salmon during an egg take on King Salmon River (Admiralty Island) appears to offer some insight on potential prespawning mortality. Chinook salmon were captured by gill net and snagging gear and held for 1 day to 1 week on stringers (seine twine through the bottom of the jaw) and tied in eddies and pools. No mortality was observed despite the fairly rough handling and treatment of the fish.

In addition, the major fishing guide on the Nakina River, who we found to be a real conservationist because he had his clients release all female

chinook salmon, was interviewed on hooking mortality and he felt that very little occurred because he had seen only one dead chinook salmon in the holes that his clients fished, during the past 3 years.

It appears that hooking and releasing of prespawning chinook salmon in the Nakina River is not a significant mortality factor.

Juvenile Chinook Studies:

Juvenile chinook salmon micro-wire tagging operations on the Taku River during the spring of 1979 were greatly reduced in duration because of potential flooding expected by washout of a large natural earth dam upstream on the Inklin River (Figure 1). Stability of the earth slide, which occurred in early December, 1978, was determined by Canadian officials to be questionable after April 10, 1979.

Field operations were conducted at Bacon's Cabin at Tulsequah from April 4 through April 10, 1979. A total of 2,549 chinook salmon smolts were captured by minnow traps and tagged (tag code 4-16-42). The average catch of chinook salmon smolts was five per minnow trap. A summary of juvenile chinook salmon tagged in all river systems during 1979 is presented in Table 5.

A total of 132 chinook salmon smolts were recaptured that had been tagged in the fall of 1978. Of these 121, or 91.7%, retained coded wire tags.

The 1977 brood chinook salmon smolts captured during April 4-10, 1979 averaged only 5.8 mm larger than fish of the same brood year during the fall, 1978. This was only about one half the average (11.5 mm) overwinter growth of the three preceding brood years (Table 6). The poor overwinter growth of the 1977 brood year was believed due, at least in part, to the Inklin slide. Residents of Tulsequah, B.C. reported that the river remained very muddy during the entire winter of 1978-1979. Upon our arrival on April 4, just after ice breakup the water was very muddy, rather than the normal greenish glacial color. It appears that all rearing and overwinter habitat in the mainstem below the slide has been affected to some degree by sedimentation.

To determine if a more efficient tool than minnow traps could be developed for capturing chinook salmon smolts, beach seining was conducted in Taku River and Taku Inlet. A total of 62 beach seine sets were made in 18 locations in the lower Taku River during the period of May 1 through May 20 (Figure 2). The study area extended from 0.75 mi (1.2 km) above the confluence of the Taku and Tulsequah Rivers to Taku Point below Taku Lodge. Snags, brush, boulders, cut banks and excessive current made seining difficult in most areas. Areas 5, 6 and 7, characterized by smooth sand beaches and eddies, which provided good resting areas for outmigrants, were the most suitable locations for seining in the lower Taku. Consequently, 43 of 62 sets, or 69% of the completed sets were made in these three areas.

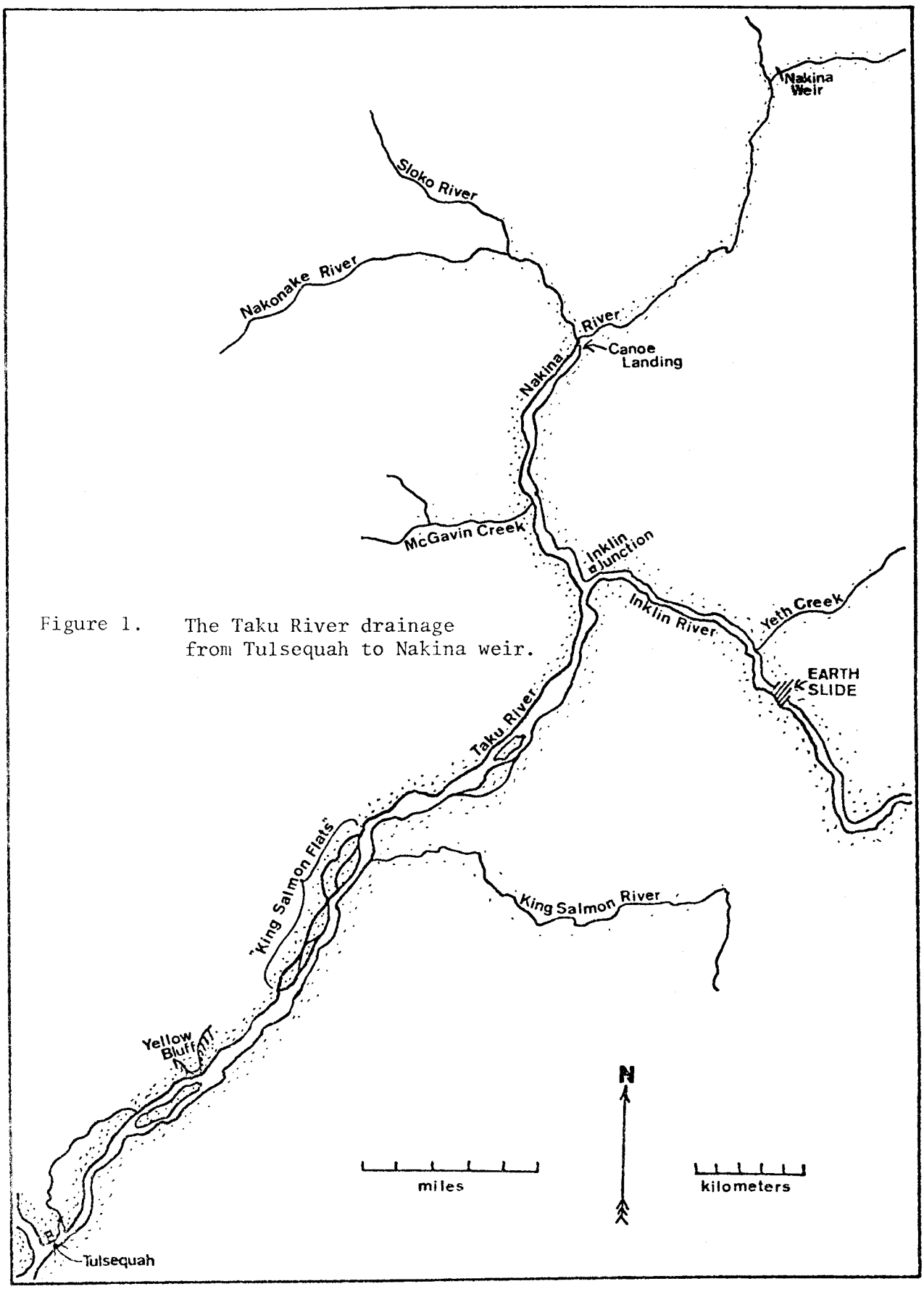


Figure 1. The Taku River drainage from Tulsequah to Nakina weir.

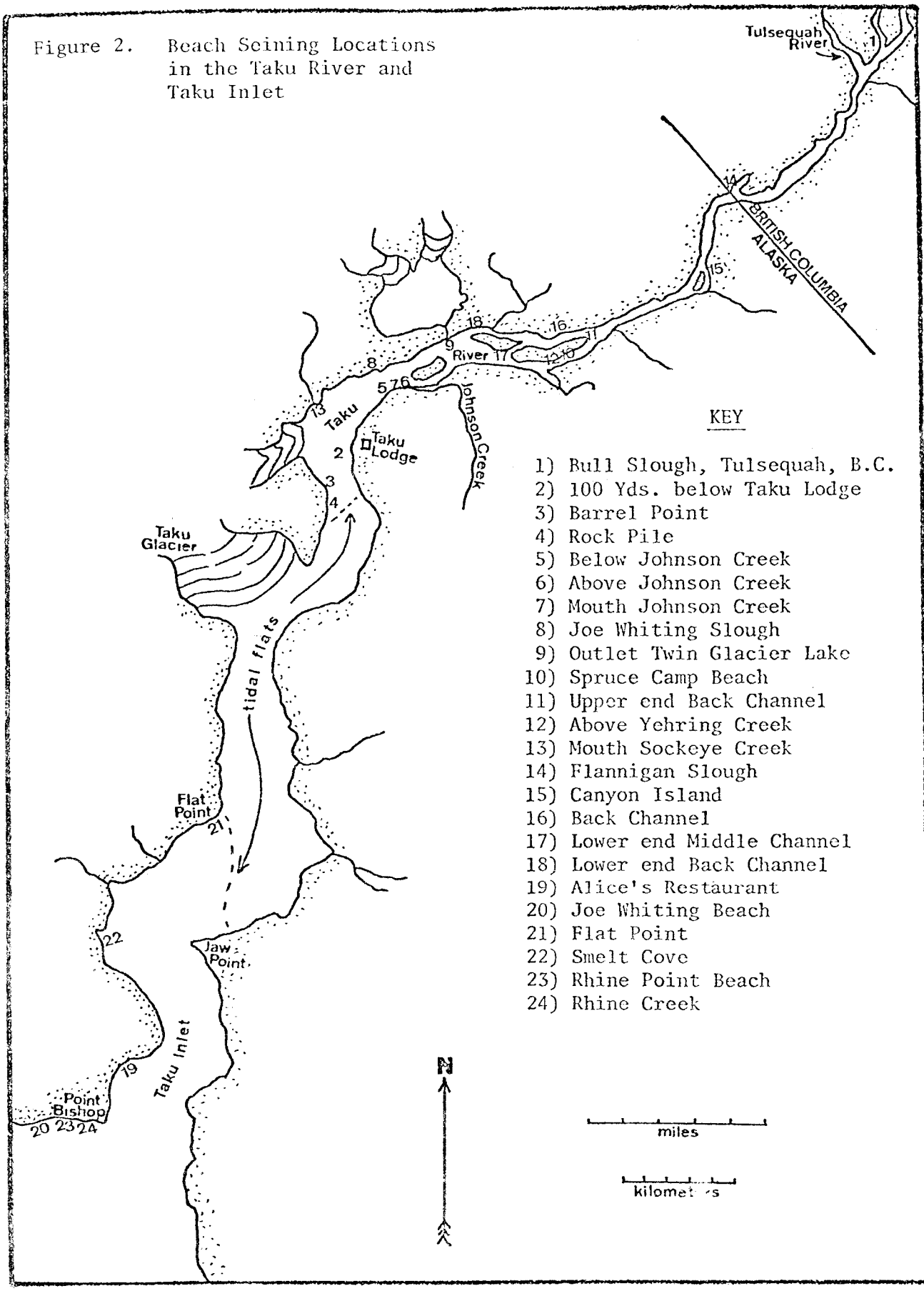
Table 5. Juvenile chinook salmon tagged by brood year code and river system, 1979.

Code	Chinook Tagged	Brood Year	Dates Tagged	Average Fork Length (mm)	River
4-16-62	2549	1977	04/04-04/11	66.2	Taku Mainstem
4-16-58	5594	1978	09/21-10/01	64.8	Taku Mainstem
4-16-59	1066	1978	10/06-10/07	68.2	Taku-Nakina
4-19-59	8881	1978	10/10-10/23	68.2	Taku-Nakina
4-16-60	4821	1978	10/23-10/30	64.8	Taku Mainstem
4-20- 4	9910	1978	09/21-10/04	64.4	Stikine Mainstem
4-20- 5	7577	1978	10/09-10/29	64.4	Stikine Mainstem
4-16-54	6677	1978	10/29-11/03	64.4	Stikine Mainstem

Table 6. A comparison of overwinter growth of juvenile chinook salmon in the Taku River.

Brood Year	Fall (Date)	Spring (Date)	Overwinter Growth
1974	(10/15/75) 61.4 mm	(05/24/76) 72.1 mm	10.7 mm
1975	(10/15/76) 64.2 mm	(05/12/77) 78.6 mm	14.4 mm
1976	(10/13/77) 61.7 mm	(05/09/78) 71.2 mm	9.5 mm
1977	(10/31/78) 63.7 mm	(05/21/79) 69.5 mm	5.8 mm
1978	(10/29/79) 66.3 mm		

Figure 2. Beach Seining Locations in the Taku River and Taku Inlet



KEY

1) Bull Slough, Tulsequah, B.C.
2) 100 Yds. below Taku Lodge
3) Barrel Point
4) Rock Pile
5) Below Johnson Creek
6) Above Johnson Creek
7) Mouth Johnson Creek
8) Joe Whiting Slough
9) Outlet Twin Glacier Lake
10) Spruce Camp Beach
11) Upper end Back Channel
12) Above Yehring Creek
13) Mouth Sockeye Creek
14) Flannigan Slough
15) Canyon Island
16) Back Channel
17) Lower end Middle Channel
18) Lower end Back Channel
19) Alice's Restaurant
20) Joe Whiting Beach
21) Flat Point
22) Smelt Cove
23) Rhine Point Beach
24) Rhine Creek

The average catch per set throughout the study was 14 chinook salmon smolts. The average catch in areas 5, 6 and 7 (combined) was 17 chinook salmon, as compared to seven chinook salmon per set in all other areas combined (Table 7).

In most instances, beach seining was effective in removing fish from an area. In two thirds of the sets, when two or more were made in succession, catches decreased on successive sets. On four occassions, catches increased on successive sets and once, catches were equal.

The largest average catch per set (areas 5, 6, 7) of 39 chinook salmon smolts occurred on May 9 near the beginning of the study. The average catch per set on succeeding days tended to decline, which may indicate that the study began at or after the peak of chinook salmon outmigration.

Sockeye salmon were taken in nearly every set, however, the largest number taken in a single set was only 12 fish. Eulachon, Thaleichthys pacificus (Richardson), were taken from May 3 through May 9 from Johnson Creek downstream and up to 53 were taken in a single set.

Beach seining in the lower Taku River during the spring outmigration is less efficient in capturing chinook salmon smolts than minnow traps and therefore should be discontinued.

Seining in Taku Inlet was conducted on six days between May 22 and June 8, 1979. Few areas suitable for beach seining were found, as the shores of Taku Inlet consist primarily of cliffs, boulders and jagged rock beaches. Tidal action causes changes in water level of up to 24 feet per day. Beach seine sets were successfully completed on six beaches on the western shore of Taku Inlet from Flat Point to Point Salisbury (Figure 2). A total of 39 sets were made and an estimated 2,211 chinook salmon smolts were captured. A summary of seine catch by area of chinook salmon is presented in Table 8.

Areas 19 and 20 were the most easily seined, and consequently nearly 85% of the sets were made in these two areas. Area 19 had three seineable beaches in close proximity separated by cliff areas. Two of these beaches could be seined at any tide level, however, the center beach could be seined at a tide level of +10 ft or greater. Area 20 consisted of a 0.75 mi long smooth gravel beach with only two or three small boulder areas that could not be seined. There was more seineable area along this one beach than in the remainder of Taku Inlet. In area 19, a total of 18 beach seine sets produced 537 chinook salmon smolts and in area 20, a total of 15 sets produced 1,559 chinook salmon smolts.

The speed at which consecutive sets could be made was directly related to the size of catches. Approximately 35 minutes were required to complete a set, sort an average catch by species and prepare the net for another set.

The most numerous of the non-target species taken were sockeye salmon (smolts). Of an estimated 1,756 sockeye taken, 1,164 were taken in a single day. An estimated 1,428 coho salmon, Oncorhynchus kisutch (Walbaum) were captured, 754 were taken in a single day.

Table 7. A summary of beach seine catches of chinook salmon smolts in lower Taku River, spring, 1979.

Seining Location	Number of Sets Made	No. of Chinook Smolts Caught	Average Per Set
1	2	22	11
2	2	39	20
3	2	5	3
4	1	2	2
5	28	493	18
6	5	112	22
7	10	114	11
8	1	6	6
9	2	2	1
10	1	6	6
11	1	2	1
12	1	4	4
13	1	0	0
14	1	1	1
15	1	4	4
16	1	1	1
17	1	14	14
18	1	16	16
TOTALS	62	843	14

Table 8. A summary of beach seine catches of chinook salmon smolts in Taku Inlet, 1979.

Date	Area 19	Area 20	Area 21	Area 22	Area 23	Area 24	Average Catch Per Set By Date
May 22	1) 53 2) 1 3) 0 4) 0	1) 24 2) 10 3) 22					110/7 = 16
May 23	1) 71 2) 0		1) 0	1) 0			71/4 = 18
May 25	1) 33 2) 0 3) 75 4) 37 5) 61	1) 10 2)114 3) 66			1)111	1) 0	507/10 = 51
May 29	1) 28 2) 42 3) 21 4) 2 5) 96	1)336		1) 0	1) 4		529/8 = 66
June 1	1) 16 2) 1	1) 83 2) 53 3)740					893/5 = 179
June 8		1) 11 2) 55 3) 1 4) 17 5) 17					101/5 = 20
Total Fish	573	1,559	0	0	115	0	2211/39 = 57
Total Sets	18	15	1	2	2	1	
Avg. Catch by Area	30	104	0	0	58	0	

Results of beach seining in Taku Inlet indicate that it is possible to capture sufficient numbers of chinook salmon smolts for coded wire tagging and it is probable that more can be captured by beach seine in the Inlet than by minnow traps in the river during the spring outmigration.

Length frequencies of 1977 brood chinook salmon smolts captured during the spring of 1979 are presented in Table 9.

A field camp was maintained at Tulsequah from September 17 through October 1, 1979. Minnow trapping of young-of-the-year chinook salmon was conducted from Tulsequah upstream through the "King Salmon Flats" to the mouth of the King Salmon River. It was initially noticed that considerable chinook salmon rearing habitat had been moved above the current water level by summer flooding and the Inklin slide had deposited much clay in our trapping areas. After 12 days of trapping known areas and exploring for new trapping areas, traps averaged only 4.2 chinook salmon each where in the past years catches had averaged 10 to 25 per trap. An estimated total of 4,844 rearing chinook salmon were tagged in the mainstem during this time.

On October 4, 1979, field operations were moved upstream to the junction of the Nakina and Inklin Rivers as test trapping conducted during the previous several days indicated that good numbers of rearing juveniles were available. Trapping was conducted on the Nakina River from the mouth, upstream to McGavin Creek, an area nearly 3 miles (4.8 km) in length. A total of 11,716 juvenile chinook salmon were tagged. Minnow traps captured an average of 9.2 chinook salmon per 24 hour set. Operations were continued at Inklin Junction until October 24, when declining catches of chinook salmon made minnow trapping in the mainstem more efficient.

On October 25, the camp was moved to Tulsequah and trapping was resumed on the King Salmon Flats. Low and clear water made conditions excellent for minnow trapping, however, additional chinook salmon rearing/trapping habitat had been lost during the flooding which had occurred while operating at Inklin Junction. The loss of habitat coupled with rapidly dropping water levels left very little trapping area available. Traps were fished October 27, 28, and 29 and respective catches were 1,413 (18.8 per trap) 1,006 (13.4 per trap) and 667 (8.8 per trap). Rearing chinook salmon had either moved into the "flats" or had been present all the time and were just being crowded into the last available habitat by the low water. On October 29, traps were removed from the river as the extremely low water made river boat travel very dangerous.

During the last 3 days of trapping, a total of 34 fish were recaptured that had been previously tagged at Tulsequah or upstream at Inklin Junction. Of these, 28 or 82.4% retained coded wire tags. This low percentage of tag retention was probably due to shallow tag placement caused by magnetism of the tag injector. The magnetism problem which started when tagging began at Inklin Junction was overcome by adjusting the injector to implant the tags deeper in the fish's snout.

Rearing chinook salmon captured in the Nakina averaged 3.4 mm larger than chinook salmon rearing in the Taku. Length frequencies of rearing chinook salmon taken from the two areas are presented in Table 10.

Table 9. Length frequency of 1977 brood chinook salmon smolts minnow trapped and beach seined in the Taku River, 1979.

Fork Length (mm)	Minnow Trapped April 8 Tulsequah	Beach Seined May 21 Areas 5,6,7
51	1	
52	1	
53	1	
54	4	
55	6	
56	4	
57	3	
58	19	10
59	12	4
60	14	8
61	11	7
62	10	10
63	6	8
64	10	11
65	13	12
66	6	10
67	13	10
68	16	18
69	7	5
70	4	11
71	8	6
72	12	10
73	7	6
74	6	7
75	5	4
76	5	5
77	5	2
78	3	3
79	0	0
80	2	5
81	3	4
82	2	3
83	0	4
84	2	0
85	1	3
86	3	2
87	0	0
88	0	4
89	1	1
90	1	1
91		1
92		1
93		1
94		0
95		2
n =	227	204
Average Length	66.2 mm	69.5

Table 10. Length frequency of young-of-the-year chinook salmon from the Taku and Glacial Nakina rivers, fall, 1979.

Fork Length (mm)	Taku Sept. 25	Taku Oct. 29	Glacial Nakina Oct. 6	Glacial Nakina Oct. 23
48				
49	1			
50	2			
51	0			
52	2			
53	5	3		
54	5	1		
55	11	3		2
56	5	2	1	2
57	6	5	1	1
58	9	6	3	4
59	15	3	8	5
60	12	16	12	5
61	10	10	7	3
62	13	14	11	12
63	9	7	11	10
64	16	13	14	8
65	19	19	17	21
66	5	10	13	20
67	13	16	5	13
68	7	11	11	12
69	11	2	13	13
70	9	12	19	17
71	5	4	7	9
72	6	6	4	8
73	2	3	4	9
74	3	11	6	8
75	1	10	10	4
76	2	2	4	3
77	2	1	1	2
78	3	1	2	4
79	0	2	1	1
80	2	3	3	3
81		0	1	1
82		0	0	1
83		2	1	2
84		0		1
85		2		0
86		0		2
87		0		0
88		1		0
89				0
90				0
91				1
92				
n =	211	201	190	207
Average Length	63.4 mm	66.3 mm	68.3 mm	68.0 mm

Stikine River Studies

Escapement:

During 1979 a total of 3,284 three and four ocean chinook salmon were enumerated in the mainstem and Little Tahltan Rivers (Table 11). Since little historical escapement data is available for chinook salmon in the Stikine all that can be stated is that the largest escapement observed to date was during 1975, when the gill net fishery had to be closed 3 weeks early because of a low catch per unit-effort. Thus the 3,608 chinook salmon escapement observed during that year was the escapement from a weak return.

Juvenile Chinook Studies:

During the period of July 27 through August 2, attempts were made to capture juvenile chinook salmon for coded wire tagging on the Little Tahltan River. Catches of young-of-the-year chinook salmon had averaged nearly 60 per trap per day during July, 1978. This year we captured only 256 chinook salmon, averaging 56.5 mm in 120 minnow trap sets. A major flood occurred either last fall or this spring as many trees were uprooted and channels altered. No young-of-the-year rainbow trout, Dolly Varden, or coho salmon were observed although they were all observed during 1978. It appears that a major washout of either eggs or fry has occurred. In future years if coded wire tagging is planned for this area it should be test trapped before a large scale operation is launched.

Fall field operations to capture and micro-wire tag young-of-the-year chinook salmon on the mainstem Stikine River began on September 17 and were completed on November 4. Juvenile chinook salmon were captured in the mainstem between the junctions of the Porcupine and Scud Rivers. The Stikine between the junction of the Porcupine River and Jack Wilson Creek is divided into many channels with numerous log jams and shallow graveled riffles while in the remainder of the area from Jack Wilson Creek upriver to Scud River the mainstem is confined to one or several large channels. As has been observed in the mainstem Taku River, catches of juvenile chinook salmon were best in the braided areas in log jams and the more the river was confined to a single channel the lower the catches. After a week of unproductive trapping in the mainstem above Jack Wilson Creek all efforts were concentrated in the mainstem braided areas between the junction of Jack Wilson Creek and the Porcupine River.

Minnow trapping of young-of-the-year chinook salmon becomes much more efficient as the large glacial rivers become clearer from decreased glacial melt during the fall. Rainstorms and resulting flooding occurred intermediately but between floods, catches were usually about 1,000 chinook salmon per day in 80-100 minnow traps.

During the fall a total of 24,164 young-of-the-year chinook salmon averaging 64.4 mm F.L. (Table 12) were captured and coded wire tagged (Table 13). An additional 4,517 coho salmon were incidentally captured but not tagged.

Table 11. Peak escapement counts of chinook salmon in the Tahltan and Little Tahltan Rivers.

LITTLE TAHLTAN RIVER

Year	Date	Chinook	Remarks
1956	August 11	334 jacks 493 adults	Hyland Ranch to Tahltan River
1957	July 21	199	Too early--fish schooled
1958	August 6	790	3/4 mile below Hyland to 1 1/2 miles below Saloon
1959	August 7	198	Fish in poor condition--survey too late
1960	August 5	346	1/4 mile below Hyland Ranch to a mile or two below Saloon
1967		800	Canadian survey
1975	August 13	700	Many spawned-out
1976	August 7	400	Conditions fair
1977	July 30	800	Peak spawning
1978	July 26	632	Mostly schooled
1979	July 28 - August 1	1,166	Peak spawning

MAINSTEM TAHLTAN RIVER

1975	August 13	2,908	Clear
1976	August 20	120	Late
1977	July 30 & August 18	0	Glacial
1978	August 8	756	Glacial
1979	August 10	2,118	Partly glacial

Table 12. Length frequency in mm of young-of-the-year chinook salmon sampled on the Stikine River during September - October 1979. n = 1468 x = 64.4 mm

Fork Length (mm)	n	%	Fork Length (mm)	n	%
48	1	.1	72	44	3.0
49	2	.1	73	34	2.3
50	4	.3	74	17	1.2
51	5	.3	75	17	1.2
52	5	.3	76	13	.9
53	13	.9	77	8	.5
54	24	1.6	78	11	.7
55	27	1.8	79	5	.3
56	45	3.1	80	4	.3
57	27	1.8	81	1	.1
58	60	4.1	82	2	.2
59	62	4.2	83	1	.1
60	80	5.4	84	3	.2
61	86	5.9	85	1	.1
62	117	8.0	86	1	.1
63	125	8.5	87	0	0
64	109	7.4	88	1	.1
65	106	7.2	89	1	.1
66	92	6.3	90	0	0
67	58	4.0	91	0	0
68	103	7.0	92	0	0
69	74	5.0	93	0	0
70	46	3.1	94	1	.1
71	32	2.2			

Table 13. Young-of-the-year chinook salmon tagged by date and code on the mainstem Stikine River, 1979.

	Total Tagged	Mortality	Total Released
Code 4-20-4 = 9910 tagged			
September 21	780	5	775
September 22	900	6	894
September 26	1,903	0	1,903
September 27	2,547	6	2,541
October 1	1,954	0	1,954
October 2	1,346	16	1,330
October 4	513	0	513
			9,910
Code 4-20-5 = 7577 tagged			
October 9	801	0	801
October 10	2,109	39	2,070
October 18	356	0	356
October 21	326	12	314
October 22	283	0	283
October 23	325	0	325
October 25	145	0	145
October 26	1,508	2	1,506
October 27	1,505	3	1,502
October 29	275	0	275
			7,577
Code 4-16-54 = 6677 tagged			
October 29	968	0	968
October 30	1,117	0	1,117
October 31	876	0	876
November 1	1,079	0	1,079
November 2	681	1	680
November 3	1,957	0	1,957
			6,677

Because of the magnitude of the Stikine River drainage and resulting daily fluctuations in water level, it is more difficult to capture juvenile chinook salmon by minnow traps than in the Taku River. Habitat is constantly changing and therefore, traps must be moved almost daily. It appears possible that small mesh weirs built at the downstream end of certain braided sloughs may catch good numbers of chinook salmon that must move out into the mainstem or be stranded. Some of the largest catches of chinook salmon by minnow trap occurred at the outlets of these braided sloughs as the water was dropping.

During 1980, coded wire tagging efforts should be concentrated on capturing young-of-the-year chinook salmon by minnow traps and small meshed weirs on the Little Tahltan River during August and the mainstem in the vicinity of the Porcupine River during mid-September thru November 1. Seining to capture smolts should be attempted in the estuary in early June.

Recovery of Tagged Chinook Salmon in 1979

A total of 16 chinook salmon coded wire tagged by the project were recovered during the year. Eleven were recovered at Nakina weir and five from commercial fisheries.

Four age 1.2 jacks tagged in the Taku River were recovered in the District 111 gill net fishery. One age 1.2 jack was recovered in the commercial troll fishery in Districts 113. Tag and recovery information is summarized in Tables 14 and 15.

Unuk River Studies

Because high water and associated low minnow trap catches of young-of-the-year chinook salmon occurred during October, 1979 on the Stikine River, extended efforts were necessary to capture significant numbers of juveniles. After departing the Stikine on November 6, low water temperatures and partial freezing of the mainstem Unuk made operations impractical.

Attempts will be made at ice out this spring to determine if chinook salmon smolts can be captured in numbers sufficient to justify coded wire tagging.

Escapement in Other Areas of Southeast Alaska

A summary of escapement enumeration in chinook salmon systems monitored annually is presented in Table 16. Escapement counts of chinook salmon in Behm Canal were low in all tributaries surveyed except in the Keta River where 426 chinook salmon were observed.

Escapement of chinook salmon into King Salmon River was disappointing as only 211 adults were observed spawning in the stream during 1973, and 1979 is the cycle return (majority usually 1.4) from that year class.

Table 14. A summary of coded wire tagging and recovery of Taku River chinook salmon tagged by the Chinook Salmon Project, 1977 to date.

DATA 4-5-8		5,294 Smolt 1975 brood 79.7 mm	Mainstem Taku, Tagged April-May, 1977 at Taku Lodge.
DATE	AGE	FORK LENGTH (FL) MIDEYE-FORK (MF)	RECOVERY TYPE AND AREA
08-10-78	1.1	360 mm (MF)	Weir, Nakina
08-13-78	1.1	330 mm (MF)	Weir, Nakina
08-15-78	1.1	410 mm (MF)	Weir, Nakina
08-18-78	1.1	295 mm (MF)	Weir, Nakina
08-23-78	1.1	355 mm (MF)	Weir, Nakina
05-17-79	1.2	683 mm (FL)	Comm. Dist. Troll. 113
07-12-79	1.2	659 mm (FL)	Comm. Dist. Gillnet 111
08-13-79	1.2	575 mm (MF)	Weir, Nakina
08-16-79	1.2	480 mm (MF)	Weir, Nakina
08-18-79	1.2	545 mm (MF)	Weir, Nakina
08-18-79	1.2	420 mm (MF)	Weir, Nakina
DATA 4-5-9		4,555 Smolt 1975 brood 79.7 mm	Mainstem Taku, Tagged May, 1977 at Taku Lodge
DATE	AGE	FORK LENGTH (FL) MIDEYE-FORK (MF)	RECOVERY TYPE AND AREA
07-27-78	1.1	330 mm (MF)	Weir, Nakina
08-04-78	1.1	310 mm (MF)	Weir, Nakina
08-15-78	1.1	335 mm (MF)	Weir, Nakina
08-16-78	1.1	310 mm (MF)	Weir, Nakina
08-20-78	1.1	330 mm (MF)	Weir, Nakina
07-05-79	1.2	595 mm (FL)	Comm. Dist. Gillnet 111
07-05-79	1.2	579 mm (FL)	Comm. Dist. Gillnet 111
07-12-79	1.2	650 mm (FL)	Comm. Dist. Gillnet 111
08-12-79	1.2	535 mm (MF)	Weir, Nakina
08-15-79	1.2	515 mm (MF)	Weir, Nakina
08-16-79	1.2	570 mm (MF)	Weir, Nakina
08-18-79	1.2	420 mm (MF)	Weir, Nakina

DATA 4-5-10	53 Smolt 1975 Brood 79.7 mm	Mainstem Taku, Tagged May, 1977 at Taku Lodge
DATA 4-17-8	5,092 Rearing Fish 1976 Brood 68.5 mm	Nahlin River, Tagged September 1977
DATA 4-17-9	3,402 Rearing Fish 1976 Brood 68.5 mm	Nahlin River, Tagged September 1977
DATA 4-17-10	4,358 Rearing Fish 1976 Brood 62.8 mm	Mainstem Taku Tagged at Tulsequah, October 1977
DATA 4-17-11	4,468 Rearing Fish 1976 Brood 62.8 mm	Mainstem Taku Tagged at Tulsequah, October 1977
DATA 4-17-12	4,796 Rearing Fish 1976 Brood 62.8 mm	Mainstem Taku Tagged at Tulsequah, October 1977
DATA 4-17-13	6,134 Rearing Fish 1976 Brood 62.8 mm	Mainstem Taku Tagged at Tulsequah, October 1977
DATA 4-17-14	2,123 Rearing Fish 1976 Brood	Mainstem Taku Tagged at Tulsequah,

DATE	AGE	FORK LENGTH (FL) MIDEYE-FORK (MF)	RECOVERY TYPE AND AREA
08-11-79	1.1	310 mm (MF)	Weir, Nakina
08-13-79	1.1	310 mm (MF)	Weir, Nakina
08-20-79	1.1	310 mm (MF)	Weir, Nakina
DATA 4-17-22		3,717 Smolt 1976 Brood 70.3 mm	Mainstem Taku Tagged at Tulsequah, May 1978
DATA 4-17-23		666 Smolt 1976 Brood 70.3 mm	Mainstem Taku Tagged at Tulsequah, May 1978
DATA 4-17-24		389 Smolt 1976 Brood 70.3 mm	Mainstem Taku Tagged at Canyon Island, May 1978
DATA 4-17-28		31,376 Rearing Fish 1977 Brood 63.9 mm	Mainstem Taku Tagged at Tulsequah, October 1978
DATA 4-17-30		7,740 Rearing Fish 1977 Brood 63.9 mm	Mainstem Taku Tagged at Tulsequah, October 1978
DATA 4-16-62		2,549 Smolt 1977 Brood 66.2 mm	Mainstem Taku Tagged at Tulsequah, May 1979
DATA 4-16-58		5,594 Rearing Fish 1978 Brood 64.8 mm	Mainstem Taku Tagged at Tulsequah, September 1979

DATA 4-16-59	1,066 Rearing Fish 1978 Brood 64.8 mm	Nakina River Tagged at Inklin Jct., October 1979
DATA 4-19-59	8,881 Rearing Fish 1978 Brood 68.2 mm	Nakina River Tagged at Inklin Jct., October 1979
DATA 4-16-60	4,821 Rearing Fish 1978 Brood 68.2 mm	Mainstem Taku & Nakina Tagged at Inklin Jct. & Tulsequah, October 1979

Adipose Clip No. C.W.T. Recoveries only from Taku River drainage

Date	Age	Fork Length (FL) Mideye Fork (MF)	Recovery Type and Area
08-06-78	1.1	335 mm (MF)	No tag Weir, Nakina
08-10-78	1.1	355 mm (MF)	No tag Weir, Nakina
08-10-78	1.1	----------	Head missing Weir, Nakina
08-12-78	1.1	----------	Head missing Weir, Nakina
08-24-78	1.1	380 mm (MF)	Tag lost Weir, Nakina
08-06-79	1.2	----------	Head missing Weir, Nakina
08-18-79	1.2	545 mm (MF)	No tag Weir, Nakina
08-20-79	1.2	470 mm (MF)	No tag Weir, Nakina
08-20-79	1.2	470 mm (MF)	Tag lost Weir, Nakina

Table 15. A summary of coded wire tagging and recovery of Stikine River chinook salmon tagged by the Chinook Salmon Project, 1978 to date.

DATA 4-17-16	357 Smolt 1976 Brood 73.9 mm	Mainstem Stikine, tagged near Iskut River mouth, May 1978
DATA 4-17-17	420 Smolt 1976 Brood 73.9 mm	Mainstem Stikine, tagged near Iskut River mouth, May 1978
DATA 4-16-33	507 Smolt 1976 Brood 73.9 mm	Mainstem Stikine, tagged at river mouth by Coho Research, May 1978
DATA 4-17-20	5,223 Rearing Fish 1977 Brood 63.6 mm	Little Tahltan Tagged September 1978
DATA 4-17-25	2,819 Rearing Fish 1977 Brood 63.6 mm	Little Tahltan Tagged September 1978
DATA 4-20-4	9,910 Rearing Fish 1978 Brood 64.4 mm	Mainstem Stikine, tagged near Porcupine River mouth, September 1979
DATA 4-20-5	7,577 Rearing Fish 1978 Brood 64.4 mm	Mainstem Stikine, tagged near Porcupine River mouth, October 1979
DATA 4-16-54	6,677 Rearing Fish 1978 Brood 64.4 mm	Mainstem Stikine, tagged near Porcupine River mouth, October 1979

Table 16. Peak escapement counts of chinook salmon in Southeast Alaska rivers, 1979.

Unuk River

Year	Chinook	Method
1961	673	Foot
1962	331	Air
1963	1,070	Air
1968	650	Air
1969	475	Air
1972	885	Air
1973	182	Air
1975	55	Helicopter
1976	198	Helicopter
1977	1,166	Helicopter, weir-foot
1978	1,765	Helicopter, Weir-foot
1979	576	Helicopter, Weir-foot

Chickamin River

Year	Chinook	Method
1961	336	Ground
1962	775	Air
1963	450	Air
1969	345	Air
1972	860	Air
1973	229	Helicopter
1974	176	Helicopter
1975	351	Helicopter
1976	122	Helicopter
1977	235	Helicopter
1978	181	Helicopter
1979	140	Helicopter

King Salmon River (Admiralty Island)

Year	Chinook	Method
1957	200	Foot
1961	117	Foot
1971	94	Foot
1972	90	Foot
1973	211	Foot
1974	104	Foot
1975	42	Foot
1976	65	Foot, Helicopter
1977	134	Foot, Helicopter
1978	57	Foot, Helicopter
1979	88	Foot, Helicopter

Table 16. (cont.) Peak escapement counts of chinook salmon in Southeast Alaska rivers, 1979.

Blossom River

Year	Chinook	Method
1961	68	Ground
1963	825	Air
1972	500	Air
1974	166	Helicopter
1975	153	Helicopter
1976	68	Helicopter
1977	112	Helicopter
1978	143	Helicopter
1979	54	Helicopter

Keta River

Year	Chinook	Method
1948	500	Foot
1950	210	Foot
1951	120	Foot
1952	462	Foot
1953	156	Foot
1954	300	Air
1955	1,000*	Air
1956	1,500*	Air
1957	500*	Air
1961	44	Ground
1975	203	Helicopter
1976	84	Helicopter
1977	230	Helicopter
1978	392	Helicopter
1979	426	Helicopter

* Probably chum salmon

Table 16. (cont.) Peak escapement counts of chinook salmon in Southeast Alaska rivers, 1979.

Situk River		
Year	Chinook	Method
1928	1,224	Weir
1929	3,559	Weir
1930	1,455	Weir
1931	2,967	Weir
1932	1,978	Weir
1933	...	...
1934	1,486	Weir
1935	638**	Weir
1936	816	Weir
1937	1,290**	Weir
1938	2,668**	Weir
1939	2,117	Weir
1940	903	Weir
1941	2,594	Weir
1942	2,543	Weir
1943	3,546**	Weir
1944	2,906	Weir
1945	1,458	Weir
1946	4,284	Weir
1947	5,077	Weir
1948	3,744	Weir
1949	1,978	Weir
1950	2,011	Weir
1951	2,780	Weir
1952	1,459	Weir
1953	1,040	Weir
1954	2,101	Weir
1955	1,571	Weir
1971	964	Weir
1972	400	Float
1973	510	Float
1974	702	Float
1975	1,180	Float
1976	1,933	Weir
1977	1,872	Weir
1978	1,103	Weir
1979	1,754	Weir

** Weir out part of the time

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